SURVIVAL OF ATLANTIC BLUEFIN TUNA (*THUNNUS THYNNUS*) LARVAE HATCHED AT DIFFERENT PH AND SALINITY CONDITIONS

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Abstract

In this study, we assessed the effect of pH and salinity as independent factors on larval survival (LS) of Atlantic bluefin tuna (ABFT –*Thunnus thynnus*) together with their Na^+/K^+-ATPase and V-type H^+-ATPase activities. Fertilized eggs of ABFT were obtained on 25 June 2016 from a spontaneous spawning of broodstock in the farming facilities at El Gorguel (Cartagena, SE Spain) of Caladeros del Mediterráneo Company. The fertilized eggs were transferred to facilities of the Spanish Institute of Oceanography (IEO) in Mazarrón (SE Spain). In a first experiment, eggs (n = 150 per treatment, in 3 replicates) were exposed to sea water salinity (SW: 38 ppt) and four pH treatments until hatch was completed (44 hours at 23 ºC): 8.0 (control), 7.7 (near future), 7.5 (far future) and 7.3 (lower). In a second experiment eggs (n = 150 per treatment, in 3 replicates) were exposed to eleven salinities treatments and constant pH 8.0 (control) until hatch was completed (44 hours at 23 ºC): 27 , 30 , 33 , 36 , 37 , 38 (control), 39 , 40 , 43 , 46 and 49 ppt. No significant differences in LS were observed with pH treatment, but lower H^+-ATPase activity was detected at control environmental pH (pH 8.0). A ‘‘U-shaped’’ relationship was observed between hatching salinity and both Na^+/K^+-ATPase and H^+-ATPase activities in whole larvae hatched, increasing both activities in groups exposed to extreme salinities. However, LS showed an inverse “U shape” curve respect to environmental salinity with higher values at intermediate salinities and lower LS at extreme salinities. These results suggest higher survival rates with lower active pumps activities. Survival results are discussed in terms of osmoregulatory cost adapting to a pH and salinity predicted for the near future scenarios. This work was funding by the European Union’s Horizon 2020research and innovation programme under Grant Agreement No. 678193.